

ICT Case Study Coursework - Hull Daily Mail Publications Ltd.

- The Organisation

The network manager at Hull Daily Mail has the job of looking after over 300 computers, 15 servers, and a huge network. If there are any problems with any part of the system, it is the IT Support department that has the responsibility to sort it out. In the IT Support department there are 6 full time employees, and 1 Saturday Assistant. Every thing to do with computers goes through the IT Department, such as repairs, new equipment, and even assistance and training.

- Network

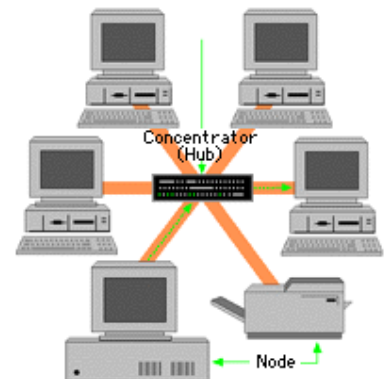
The network uses a STAR topology because it is very flexible and fast, and safe.

The advantages are outlined below:

- Low startup costs
- Easier to manage than a 'bus' topology
- Easy to expand
- Widely used, a variety of equipment available

There are also disadvantages of the STAR topology:

- The hub is the single point of failure, if that breaks it all breaks
- Requires more cable than a 'bus' design



- File Handling

- File Storage

Files are mainly stored on one of the file servers. This is so that every one with access to the file server with the file on can have access to that file. The file servers

each consist of 6 hard disks connected through a RAID controller (see below for more) to ensure that data is not lost or corrupt . Each file server has around 60GB storage space.

Files are also stored on the servers because it allows the data to be managed easily, and larger files do not take up lots of room on the users Hard Disk which may cause errors.

A lot of images that are stored have 2 copies, a Low Resolution and a High Resolution Copy. If one of these files is missing, then that image is classed as unusable. When an image is inputted into the system, it is stored as a High Resolution image, and a low resolution copy is made instantly by a piece of software running on one of the servers. A Low Resolution image is needed for page designing, it can be transmitted over the network quickly, and it can be used in documents without taking up lots of room or slowing the users work station down. The High Resolution image is used for printing so that the maximum quality can be achieved.

- Storage and access for user software

All of the software for the users is stored on their local Hard Disk. This is because it is a lot quicker to load a program, and it saves unnecessary network traffic. When a machine is set up there are no access restrictions enabled on the local machine, most of the machines are personal to their user (not shared between many people), and therefore users can install any software they like onto their machine as long as it causes no damage to the network or the machine itself.

A piece of software installed on many of the machines requires a connection to the server to operate. This piece of software is called sentinel which handles all advertisements and billing for advertisements. This system is password protected on

the server because it contains sensitive information such as credit card details and addresses. Only the people who require access to this will be given access.

- RAID

RAID is for method of protecting data from becoming corrupt or lost. At the hull daily mail with use mirroring and stripe sets, also known as RAID 5.

Mirroring is when there are 2 drives, one has the information on which is been used (the LIVE data), and the other has a backup copy of that data. Every time a change/addition/deletion is made to the live data, it is automatically made to the backup data. If one of the disks fail, the backup drive is brought straight into action and a message is broadcast to all the IT support computers. The users do not notice any difference. The problem with this method is that you only get half of the total space which you have.

Striping is another method used to secure data. An example of this would be a system with four disks. When a piece of information is stored on the server, it is spread across 3 of the drives, and on the 4th drive there is a total of what each piece of data access the 3 drives adds up to. E.g.

Disk #	Data Stored
1	3
2	6
3	2
4	11

As you can see, the data has been spread across 3 of the disks, and a check sum of the data stored on the other 3 disks has been stored on the 4th disk. If disk 2 was to fail now, the data which was on that disk can be calculated using the sum $\text{DISK 2} = \text{DISK 4} - \text{DISK 1} - \text{DISK 2}$. This can be done and the system can easily run with one disk short, although the performance of the system would be considerable poor. When a new disk can be put in place of disk 2, the data can be re-generated and written to the new disk and the system will run as normal.

The Hull Daily Mail use both of these methods to ensure maximum security of the data.

- Users

- Security

- Physical Security

With over 300 computers in the building, there has to be high security. All entrances into the building are protected by a key pad lock, each member of staff has their own security code to go into the building. As well as keeping people out who don't work there, they have to control where different members of staff can go in the building, which means that they have key pad locks on some internal doors as well, such as the entrance to the server room. There is also one security guard on duty 24 hours a day, 7 days a week, who checks the whole building every hour.

The computer room is where all the servers are kept, it is air conditioned to keep the computers running in a cool environment. If there is a fire in the computer room it will be extinguished immediately by Halogen Gas.

- Backup Procedures

Backups are taken every night from each server. Most servers have a backup tape for every day of the week, but some only have one tape which gets overwritten each night. Backups are done over night because this is when the servers are the least active. Backups are done in case of fire, theft, floods etc, and therefore are stored in a fire/water proof safe. As well as this on Friday the tapes are taken to the Paragon Street Office. This is because if the fire safe fails then there are some offsite backups from no more than a week before.

- Protection Against Viruses

The Hull Daily Mail believe that they are well protected against viruses. They have 2 main defences against viruses.

The first line of defence is on the Exchange email/internet server. When an email is sent the attachments are checked automatically, and if they are suspicious they will be taken off the email, and replaced by a foot note on the email to let the recipient know that an attachment has been removed. The attachment will be stored on the server until somebody from IT support checks it and deletes it.

The second line of defence protects from a wider range of sources. On each windows PC Dr Solomans Virus Scanner is installed, and set up to scan every floppy disk and CD Rom when it is inserted into the computer, and it is also set up to check the Hard

Drive, RAM and ROM for viruses every time the computer is turned on. It also checks every downloaded file and every email. Apple Mac there is a similar program called Virex which is set up to do exactly the same. Each of these programs are usually updated weekly if there is an update available. Instead of going around each computer updating the virus scanner, both of the programs are set up to download the virus update file from a server, so all the IT Support staff have to do is place the update on the server, and all the computers will download the latest update when they are turned on.

- Net Issues

- Internet, Intranet, and Email

The Hull Daily Mail is connected to the Northcliffe Data Network which is a WAN across the whole of England, Wales, and Scotland, linking every newspaper in their group. This gives access to email, intranet, and Internet. The Hull Daily Mail is connected to the Northcliffe Data Network through Nottingham which is the central network connection centre for the north of England and Scotland (See Figure 2). They have a 512KB connection. As well as this connection, they have a fractional T1, which is 1.5MB shared between the Hull Daily Mail's main offices, and the Paragon Street office. This gives an extremely fast connection to the Internet, and allows emails to be sent outside to the Northcliffe Data Network.

Email and Internet access is not given to everybody. Only certain people are placed in the Internet User Group by IT support staff if they are considered to need use of the Internet. This keeps the connection fast enough for things which need to be done, and does not become lagged by people surfing around, downloading MP3's, and going on Chat Lines. This also stops employees wasting a lot of their time doing useless things.

When someone has access to the Internet there are trusted not to go on inappropriate sites. All Internet activity is logged and is checked by the IT staff daily. If someone is found to have been on one inappropriate site, such as porn sites, then their access to the internet will be stopped and they will be given an official warning. If they keep going on inappropriate sites then they can be sacked.

Email is also only given to people who the IT Support Staff consider to need it. They use Microsoft Exchange Server to control the email accounts. Each account has a 100MB mailbox because if they get too big then the server slows down for everybody. Clients who need email will have Microsoft Outlook 97 or 2000 installed on their computer, and they will be given the appropriate 'Outlook Starters Booklet' produced by the IT Support Staff.

- Development

- Maintenance and Enhancement

Every 6 months a technician from Dell and a technician from Compaq come to inspect all of the Dell and Compaq servers. They inspect the latest system logs to check that everything is running smoothly and they fix any problems. Some times they will upgrade the OS or drivers, and check that the servers are performing their best. They will also do any major hardware upgrades which may need doing.

At the moment the long process of upgrading users to have privileges to use email. A lot of the workstations are low spec (not very powerful, not much RAM), and they need upgrading to run Microsoft Outlook 97 smoothly. These machines are being enhanced to support new applications.

Once a year there is a review carried out of every workstation. Workstations which are very old and which are considered to reduce the amount of work an employee can carry out will be replaced.

- Staff Training

When a new member of staff who will be using computers joins the Hull Daily Mail, they are assessed on their ability with computers. Depending on how much they know they may be sent on a course. At the moment a new 'introduction to computers' course is been set up by the IT support staff which will be a half day crash course in the basic use of computers. At the moment, if they do not feel that a person knows enough to use a computer efficiently they will be sent on a 2 day course. This only covers the basic computer knowledge. The Hull Daily Mail also use some specialist applications such as Adobe Photoshop, Adobe Illustrator, QuarkXpress to name but a few. Specialist training for these applications is organised by their department manager.

The training of the IT Support Staff is also based upon what they already know. When a new employee joins the team on the first day they are shown the whole system, how it works, what it is used for, etc. In the few days after that they are shown how to solve typical problems as they arise. This is all done by another member of the IT Support Team. Certain people from the IT Support Team will be chosen to go on certain courses, as they can be very expensive. Courses such as NT Server Management and Network Management are not considered to be needed for all the IT Staff, as one member of the team can take the course and then be responsible for that area of the system.